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consultation services
foundation & site exploration
testing of soils, concrete & bituminous materials

February 19, 1980

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VILLAGE OF PALOS HILLS
8555 West 103rd Street
Palos Hills, Illinois 60465

Attention: Mr. Ray Derbas
City Engineer

RE: Existing Landfill Site
West of Harlem Avenue and
South of 105th Street
Palos Hills, Illinois

Gentlemen:

We have made five (5) soil borings at the above captioned site. The subject property contains approximately 38 acres and is bordered on the north by 105th Street, on the south by Stony Creek and on the east by Harlem Avenue. The dimension, at the east end - in a north-south direction is approximately 450 feet with the width increasing rather uniformly to 1700 feet at the west end. The dimension in an east-west direction is 2600 feet - along 105th Street. The present topography for the site is a result of man-made fill with slightly higher elevations to the north and to the west. The site, in general, was clear of trees and brush. Slopes, along the creek were steep with tree cover. Some seepage into the creek from the north creek bank was observed.

The purpose of performing this work was to determine the kinds of material that presently exist beneath the landfill.

Our understanding has been that most of the fill placed at this site consisted of solid waste material. These materials had been deposited a number of years ago with the final clay cover being placed only a few years ago.

A plan showing the locations of the five borings is included with this correspondence. The borings were made using a truck-mounted drill rig with the bore holes being advanced by continuous auger flight methods. The soil samples were taken by Split Spoon Samples in accordance with currently recommended ASTM procedures. A copy of these procedures is included with this correspondence. The samples were examined and classified in the field with respective portions being placed in glass containers with screw-type lids and carried to our laboratory for further examination

and testing. The laboratory work was performed under the supervision of a Geotechnical Engineer. Laboratory testing included water content and unconfined compression strength determinations for cohesive materials. Several coefficient of permeability tests were made for natural soils underlying the fill. The test data along with soil descriptions are shown on boring logs which are included with this correspondence.

Ground surface elevations at the bore hole locations were referenced to an assumed datum of 100.0 as indicated on the Boring Location Plan. Relative elevations ranged from 106.3 for Boring 1 to 99.5 for Boring 5. As previously stated, the west end of the property was 5 to 6 feet higher than the east end. There was also a slight slope from the north to the south side of the property. Three elevations were taken for the water surface at the creek bottom. These elevations were between 82.4 and 84.6. (Due to the difficulty in obtaining elevations along the creek because of brush - these elevations are considered to be correct only to the nearest one foot.)

Four of the five borings showed a "cover" material which was described as a silty clay. (This material was not found for Boring 2.) The thickness of the cover material ranged from 4.5 to 6.0 feet. Below the clay cover and beginning at the surface for Boring 2, the fill was generally described as a mixture of:

"Silt, clay, gravel, paper, glass,
cinders, fabrics, rubber, wood,
plastics and other refuse materials."

The fill was sampled to the following depths and elevations:

BORING NUMBER	GROUND SURFACE ELEVATION	DEPTH OF FILL	ELEVATION AT BOTTOM OF FILL	SOILS IMMEDIATELY BELOW BOTTOM OF FILL
1	106.3	17.0	89.3	Silty SAND
2	100.1	7.0	93.1	Silty SAND
3	105.8	16.0	89.8	SILT
4	104.1	21.0	83.1	Clayey SILT
5	99.5	13.0	86.5	SILT

Three coefficient of permeability tests were made for samples taken below the fill. The test data are summarized below and are also given on the individual boring logs.

BORING NUMBER	SAMPLE NUMBER	DEPTH IN FEET	K IN cm/sec.	SAMPLE DESCRIPTION
1	5	21.0-22.5	5.44×10^{-5}	Silty fine SAND with layers of clayey SILT
3	4	18.5-20.0	6.48×10^{-5}	Clayey SILT, trace gravel, occasional silt layers
5	4	16.0-17.5	1.40×10^{-4}	Fine to medium SAND, some small to medium gravel

K = Coefficient of permeability. The above values may be multiplied by 2 to convert cm/sec. to feet per minute.

With a surface cover of silty clay of over four feet for four of the five boring locations, we would not expect large quantities of water to percolate into the underlying fill. Also due to some slope of the ground surface, most water from rainfall and snow melt will run off to the creek without entering the landfill proper. However, some water can be expected to move through the clay cover. This would be relatively small quantities of water where there are cracks in the clay cover or lesser thicknesses for the clay cover.

Once water enters the landfill, it can be expected to move vertically to the zone of natural soils. Observations of the water table for Borings 2 and 4 suggest water movement from the northeast corner toward the southwest corner.

As stated previously, there is some leachate now leaving the landfill proper and entering Stony Creek. We would recommend that this be sampled and tested. Also we would recommend observation wells be installed adjacent to the southwest corner of the property and south of Stony Creek - probably between the Borings 3 and 5 locations. Water samples taken from these wells should be analyzed to see if leachate is leaving the site through the ground water table.

We believe that the possibility of polluting the ground water table is not likely to represent a serious problem. This would be because of several reasons:

(1) We understand that there are no wells in this immediate area that could accelerate the movement of ground waters.

(2) The quantities of water that can be expected to enter the landfill - with the clay cover - are small.

(3) There can be a considerable amount of mixing of leachate with natural waters. This will cause dilution and as the mixture moves through soil the leachate is further reduced as a pollutant by attenuation.

It has been a pleasure to assist with this work. Please call us if there are questions or if we can be of further service.

Respectfully submitted,

TESTING SERVICE CORPORATION

Lawrence A. DuBose,
President and Registered
Structural Engineer
Illinois, No. 2421

LAD:sa

Enclosure: ASTM D 1586-67
Legend for Boring Logs
Boring Logs
Boring Location Plan